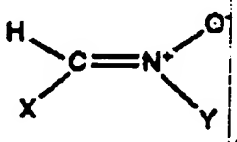
We claim:

1. A pharmaceutical composition comprising a non-toxic spin trapping compound of the formula:

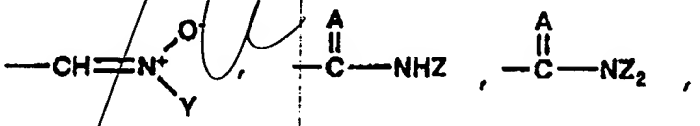


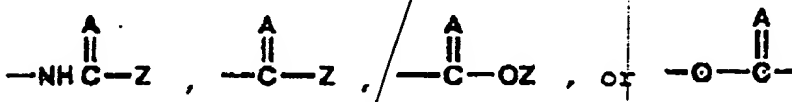
wherein:

X is phenyl, imidazolyl, phenothiazinyl or  ;

n=1-5, preferably 1-3;

R^2 = independently (can vary within the molecule) halogen, alkyl, oxyalkyl, alkenyl, oxyalkenyl, OH,

NH_2, NHZ, NZ_2, NO, 

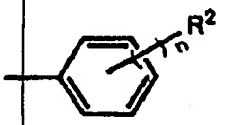


$-SO_3H$, $-OSO_3H$, SH, -S(alkyl), -S(alkenyl), and haloalkyl, specifically including $-CF_3$;

A = O or S; and

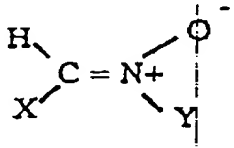
Z is a C_1 to C_6 straight, branched, alkyl or cyclic group; and

Y is a tert-butyl group that can be hydroxylated or acetylated at one or more positions; phenyl or



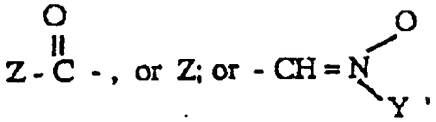
excluding compounds of the formulae:

a)

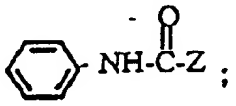


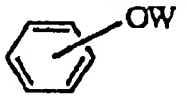
wherein:

X is phenyl or  , wherein R is H,

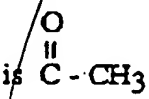
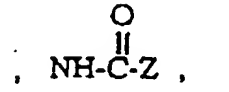
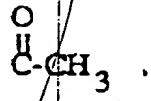
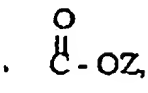


and n is a whole integer from 1 to 5; or



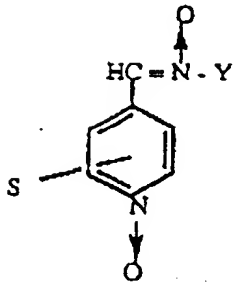
Y is a tert -butyl group that can be hydroxylated or acetylated on one or more positions; phenyl; or 

;

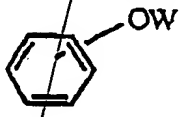
wherein W is 



or Z; and

Z is a C_1 to C_5 straight or branched alkyl group;

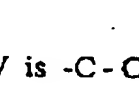
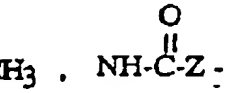
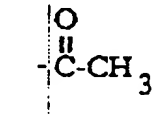
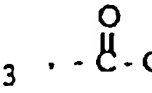
and

b) 

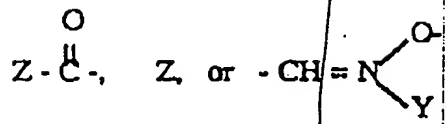
wherein

Y is a tert -butyl group that can be hydroxylated or acetylated on one or more positions; phenyl; or 

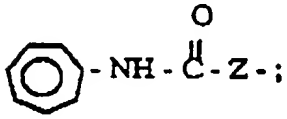
;

wherein W is 



or Z; and

S = H, $(OR)_n$, wherein R is H,



n is a whole number from 1 to 4, or



Z is a C_1 to C_5 straight or branched alkyl group;

in a pharmaceutically acceptable carrier for administration to a patient.

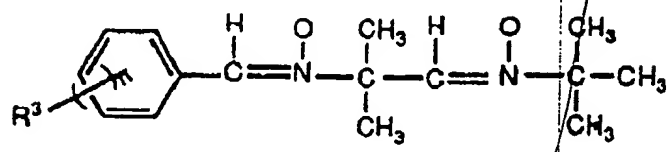
2. The composition of claim 1 wherein the spin trapping compound is covalently linked to a second biologically active molecule.

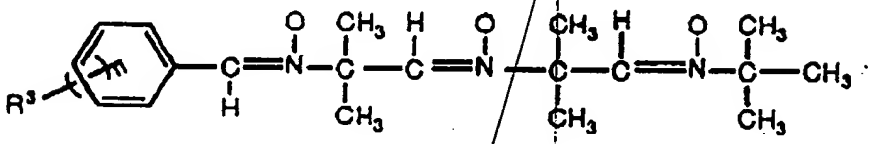
3. The composition of claim 2 wherein the second biologically active molecule is selected from the group consisting of neuroactive compounds, hormones, enzymes, antibodies, and carbohydrate molecules specifically bound by cell surface receptors.

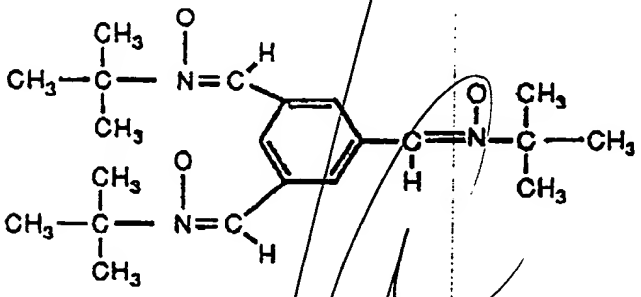
4. The composition of claim 1 wherein multiple units of the spin trapping compound are formed into one molecule for administration to a patient.

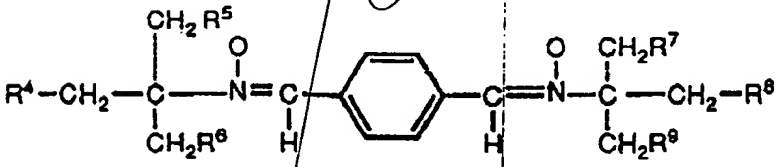
5. The composition of claim 1 wherein the pharmaceutical carrier is selected from the group consisting of carriers for intravenous administration, oral administration, administration via the respiratory tract, subcutaneous administration, intramuscular administration, rectal administration, and topical administration.

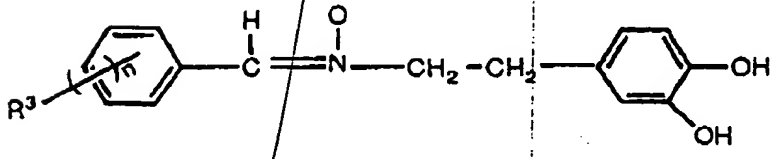
6. The composition of claim 1, wherein the spin trap is selected from the group consisting of:

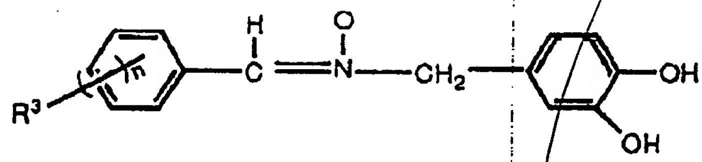


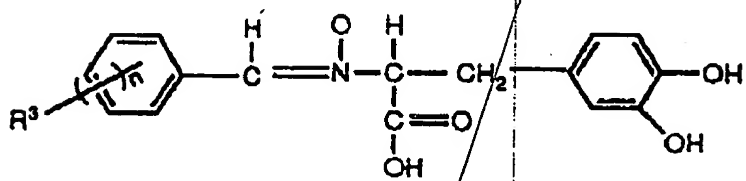


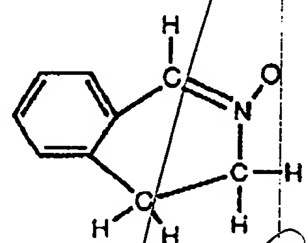




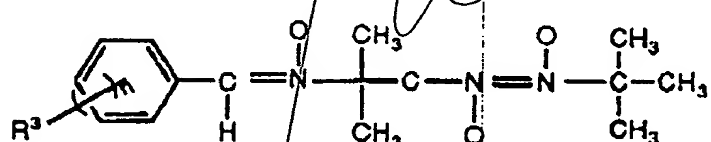


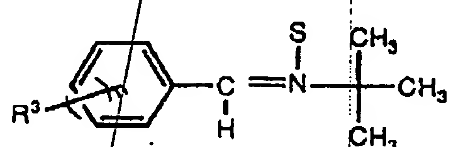




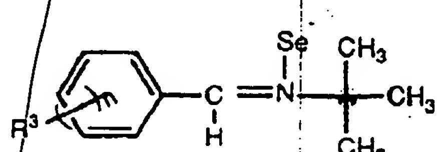


PBN CYCLIZED





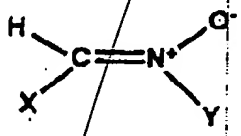
and



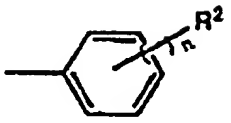
wherein R^3 = independently R^2 (that can vary within the molecule) or H;

and R^4 to R^9 are independently R^2, H or

7. Use of a pharmaceutical composition comprising a non-toxic spin trapping compound of the formula:

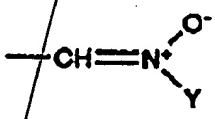
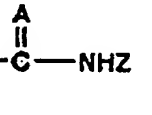
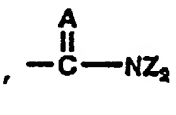


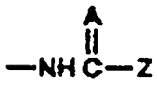
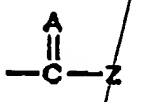
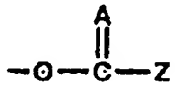
wherein:

X is phenyl, imidazolyl, phenothiazinyl or  ;

n=1-5, preferably 1-3;

R^2 = independently (can vary within the molecule) halogen, alkyl, oxyalkyl, alkenyl, oxyalkenyl, OH,

NH_2, NHZ, NZ_2, NO,  ,  ,  ,

 ,  ,  , or  ,

$-SO_3H$, $-OSO_3H$, SH, -S(alkyl), -S(alkenyl), and haloalkyl, specifically including $-CF_3$;

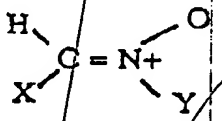
A = O or S; and

Z is a C_1 to C_6 straight, branched, alkyl or cyclic group; and

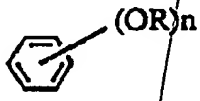
Y is a tert-butyl group that can be hydroxylated or acetylated at one or more positions; phenyl or

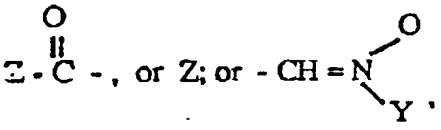
excluding compounds of the formulae:

a)

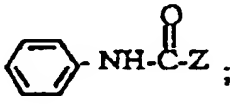


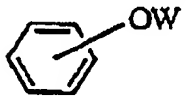
wherein:

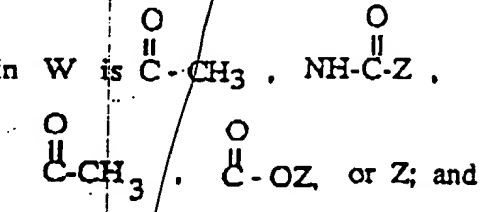
X is phenyl or  , wherein R is H,



and n is a whole integer from 1 to 5; or

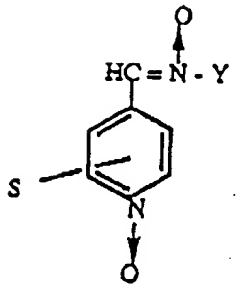


Y is a tert -butyl group that can be hydroxylated or acetylated on one or more positions; phenyl; or  ;

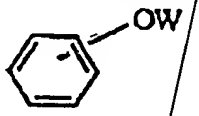
wherein W is  , or Z; and

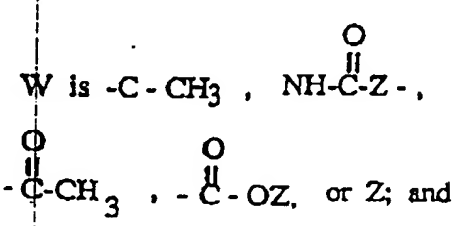
Z is a C_1 to C_5 straight or branched alkyl group;

and

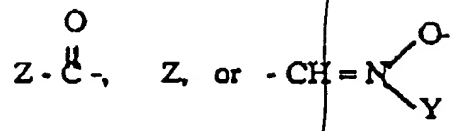
b) 

wherein

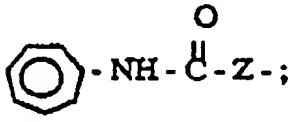
Y is a tert -butyl group that can be hydroxylated or acetylated on one or more positions; phenyl; or  ;

wherein W is  , or Z; and

S = H, $(OR)_n$, wherein R is H,



n is a whole number from 1 to 4, or



Z is a C_1 to C_3 straight or branched alkyl group;

in a pharmaceutically acceptable carrier in the manufacture of a medicament for the treatment of a disorder associated with oxidation of a protein or a lipid wherein the disorder is a disorder of the central or peripheral nervous system or a disorder of a peripheral organ.

8. The use according to claim 7 wherein the disorders of the central nervous system are selected from the group consisting of stroke, aging, Parkinsonism, concussion, aneurysm, ventricular hemorrhage and associated vasospasm, migraine and other vascular headaches, spinal cord trauma, and neuroanesthesia adjunct.

9. The use according to claim 7 wherein the disorders of the peripheral nervous system are selected from the group consisting of diabetic peripheral neuropathy and traumatic nerve damage.

10. The use according to claim 7 wherein th disord rs of the peripheral organs are selected from the group consisting of atherosclerosis, chronic obstructive pulmonary disease (COPD), pancreatitis, pulmonary fibrosis due to chemotherapeutic agents, angioplasty, trauma, burns, ischemic bowel disease, wounds, ulcers and bed sores, lupus, ulcerative colitis, organ transplantation, renal hypertension, overexertion of skeletal muscle, and epistaxis (pulmonary bleeding).

11. The use according to claim 7 wherein the disorders are a result of exposure to radiation.

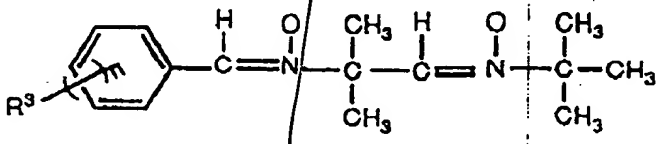
12. The use according to claim 7 wherein the disorders are a result of exposure to cytotoxic compounds.

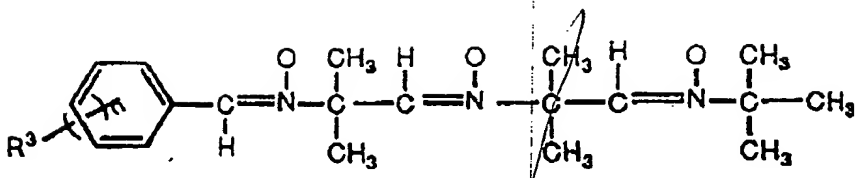
13. The use according to claim 7 wherein the disorder is oxidation of low density lipoprotein.

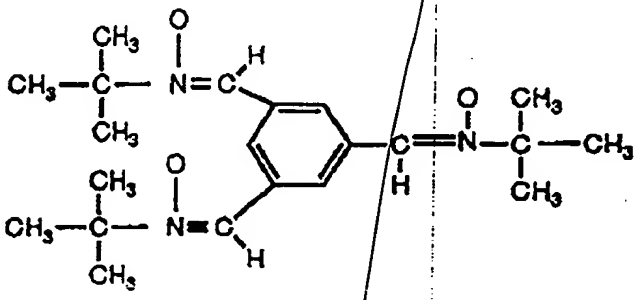
14. The use according to claim 7 wherein the composition is administered in a pharmaceutical carrier for topical application.

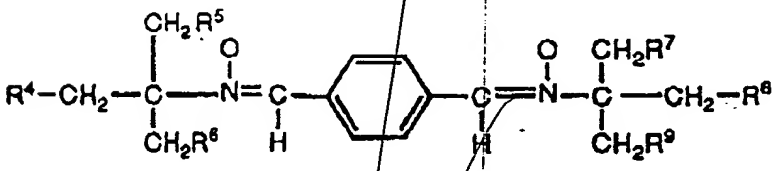
15. The use according to claim 7 wherein the composition is administered systemically.

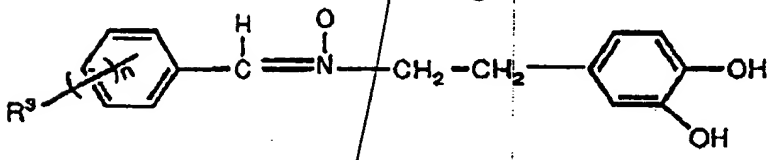
16. The use according to claim 7, wherein the spin trap is selected from the group consisting of:

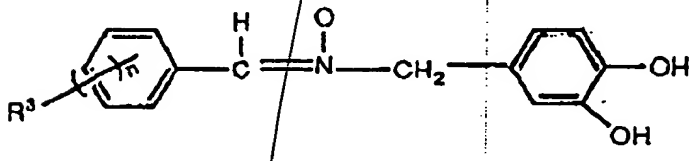


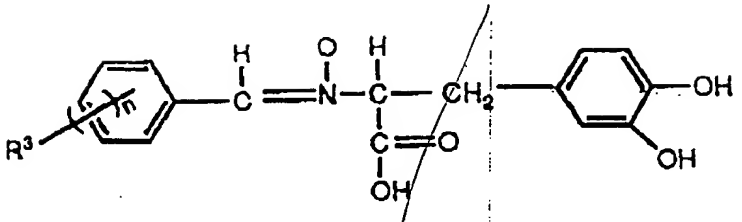


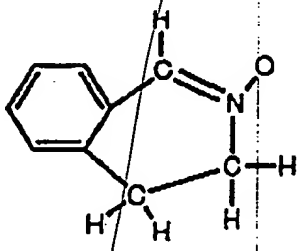












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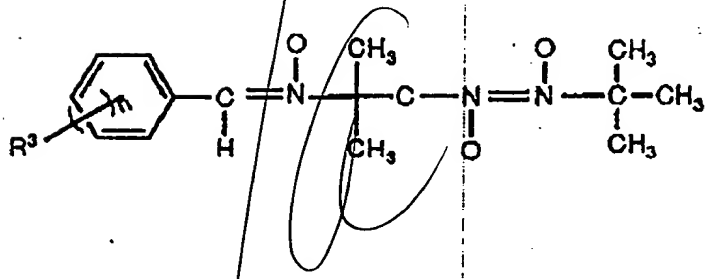

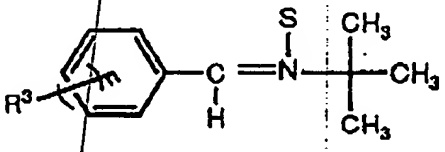

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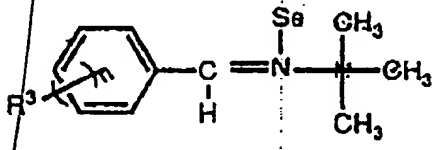

wherein R^3 = independently R^2 (that can vary

within the molecule) or H;

and R^4 to R^9 are independently R^2, H or